neptronic®

Room Humidistat
Specification & Installation Instructions

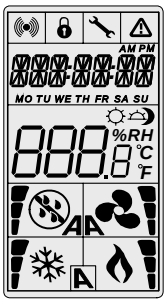
Features:

HRO20

- Attractive modern look with large LCD and backlight
- Icons driven information and 1 line of text
- External humidity sensor input
- Humidification and dehumidification indicator
- Multi level lockable access menu
- Lockable Set point / Control mode
- Window/outside temperature sensor input
- Celsius or Fahrenheit scale selectable

Technical Data	HRO20
Outputs	Actual humidity (0-100 %RH), 0-10 Vdc / 2-10 Vdc
	Humidity set point (0-100 %RH), 0-10 Vdc / 2-10 Vdc
	Humidification proportional control signal, 0-10 Vdc / 2-10 Vdc
	Dehumidification proportional control signal, 0-10 Vdc / 2-10 Vdc
	Humidification dry contracts 24 Vac, 1 A max, 3 A in-rush
	Dehumidification dry contracts 24 Vac, 1 A max, 3 A in-rush
Inputs	Window temperature sensor or outside temperature sensor (10 KΩ)
	External set point from Neptronic humidifier, external humidity sensor (0-10 Vdc / 2-10 Vdc) or high limit (0-10 Vdc / 2-10 Vdc)
	1 alarm status digital input (24 Vac or dry contact)
Power supply	22 to 26 Vac 50/60 Hz or 28 to 32 Vdc
Power consumption	1 VA
Set point range	10 - 90 %RH (in 1% increments)
Sensor precision	± 3 % or better at 40 %RH and 23 ºC [73 ºF]
Proportional band	2 % - 10 % for control signal
Electrical connection	0.8 mm^2 [18 AWG] minimum
Operating condition	0 ºC to 40 ºC [32 ºF to 104 ºF], 0-95 %RH
Storage condition	-10 ºC to 50 ºC [14 ºF to 122 ºF], 0-95 %RH
temperature compensation reset feature	Automatic readjustment of set point from a window temperature sensor (SHW0-11) or external temperature sensor (STC8-11)
Housing degree of protection	IP 30 (EN 60529)
Weight	80 g. [0.18 lb]

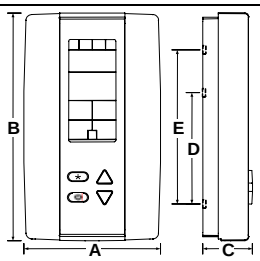
Presentation



Symbols on display

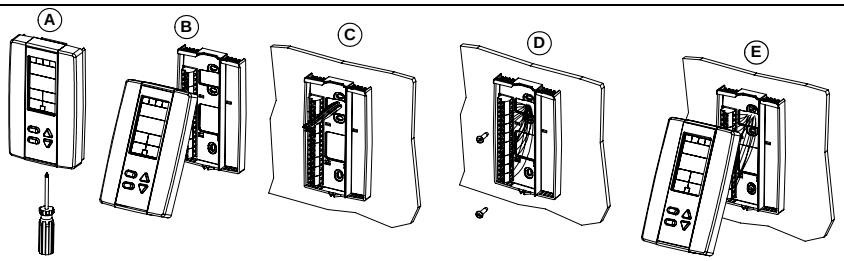
	Humidification ON 33,66,100% output	***°C or °F***	***ºC: Celsius scale ºF: Fahrenheit scale***		***Alarm status***
	Dehumidification ON 33,66,100% output		***Menu set-up Lock***		
%RH	***Percentage of humidity***		***Programming mode (Technician setting)***		

Dimensions



Dimension	Imperial (in)	Metric (mm)
A	2.85	73
B	4.85	123
C	1.00	24
D	2.36	60
E	3.27	83

Mounting Instructions



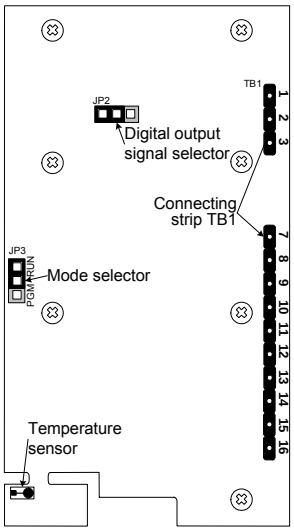
CAUTION: Risk of malfunction. Remove power prior to separate humidistat cover from its base.

A. Remove the screw (captive) holding the base and the front cover of the humidistat.
B. Lift the front cover of the humidistat to separate it from the base.
C. Pull wire through the base hole.
D. Secure the base to the wall using wall anchors and screws (supplied). Make the appropriate connections.
E. Mount the control module on the base and secure using the screw.

Terminal Description

TB1	**1**	Common
	2	24 Vac or 30 Vdc
	6	Not used
	7	Common Relay
	8	Humidify contact output (DO1)
	9	Dehumidify contact output (DO2)
	10	Humidify set point analog output (AO4) Note: If dehumidify only is selected, AO4 = 0 V
	11	Alarm status digital input (DI1)
	12	External set point from Neptronic humidifier, external humidity sensor (0-10 Vdc / 2-10 Vdc) or high limit (0-10 Vdc / 2-10 Vdc) (AI1)
	13	Window temperature sensor or outside temperature sensor input (AI2)
	14	Humidify analog output (AO1)
	15	Dehumidify analog output (AO2)
	16	Actual humidity output (0-100 %RH) (AO3)

Settings on PC Board



Digital Output Signal Selection (JP2)

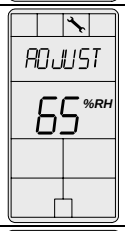
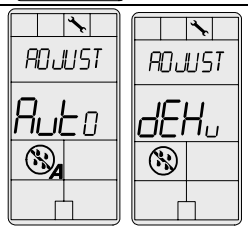
JP2 24VAC	**Jumper (JP2) on 24 Vac:** All digital output signals are linked to 24 Vac.	JP2 COM	**Jumper (JP2) on COMMON RELAY:** All digital output signals are linked to common relay.

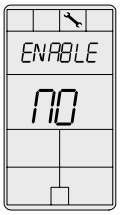
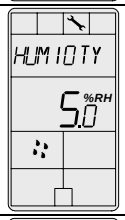
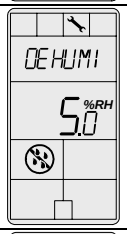
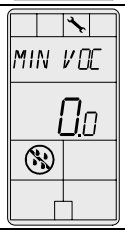
Mode Selection (JP3)

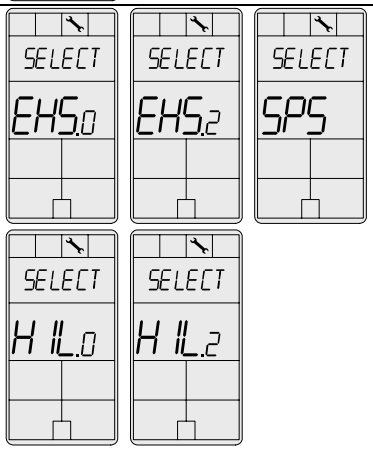
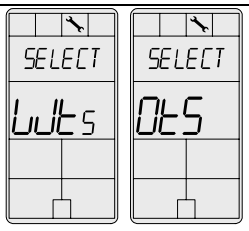
JP3 RUN PGM	**Jumper (JP3) on RUN:** Humidistat is in **operation mode**. Humidistat must be set in this mode to operate properly. If not locked, set point may be modified by end user.	JP3 RUN PGM	**Jumper (JP3) on PGM:** Humidistat is set in **Programming mode**. Refer to following section about all settings description

Programming Mode

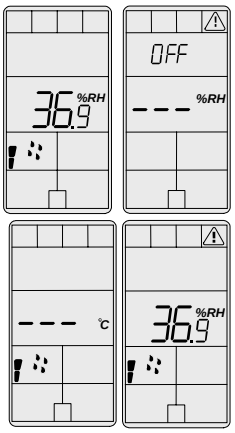
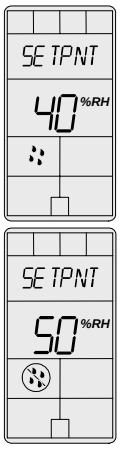
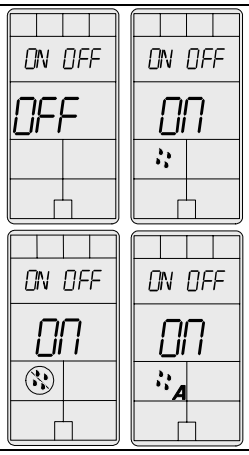
When in this mode this symbol is displayed. Please press on button ⊛ to advance to the next program function, press on button ⏻ to return to preceding stage and press on button △ or ▽ to change value. You can leave the programming mode at any time, changed values will be recorded.

Step	Display	Description	Values
1		**Internal humidity sensor offset calibration:** Display shows *"INSIDE HUMIDTY SENSOR OFFSET"* and the relative humidity percentage read by internal humidity sensor. Humidify symbol is also displayed. You can adjust the calibration of the sensor by comparing with a known humidistat. For example if humidistat has been installed in an area where humidity is slightly different than the room typical humidity (humidistat installed right under the air diffuser).	Range: 10 to 90 %RH (max. offset ± 5 %) Increment: 0.1 %RH 0.0 %RH no humidity sensor (factory calibrated)
2		**Internal temperature sensor calibration:** Display shows *"INSIDE TEMPER SENSOR OFFSET"* and the temperature read by internal temperature sensor. You can adjust the calibration of the sensor by comparing with a known thermometer. For example if thermostat has been installed in an area where temperature is slightly different than the room typical temperature (humidistat installed right under the air diffuser).	Range : 10 to 40 ºC [50 to 104 ºF] (max. offset ± 5 ºC) Increment: 0.1 ºC [0.2 ºF] (factory calibrated)
3		**Minimum set point:** Display shows *"ADJUST MINIMUM USER SETPNT"* and the minimum humidity set point. Please select the desired minimum humidity set point. The minimum value is restricted by the maximum value. (step #4)	Minimum range: 10 to 90 %RH Increment: 1 %RH *Default value: 15 %RH*
4		**Maximum set point:** Display shows *"ADJUST MAXIMUM USER SETPNT"* and the maximum humidity set point. Please select the desired maximum humidity set point. The maximum value is restricted by the minimum value. (step #3)	Maximum range: 10 to 90 %RH Increment: 1 %RH *Default value: 65 %RH*
5		**Locking the set point:** Display shows *"USER SETPNT LOCKED"* and the status of the function. You can lock or unlock the end user set point adjustment. If locked, *"YES"* and lock symbol will appear.	*Default value: Unlocked (NO)*
6		**Adjust the control mode:** Display shows *"ADJUST CONTROL MODE"*. Humidify or dehumidify symbols are also displayed. Select which control mode you want to authorize: Automatic humidify and dehumidify (**Auto**), humidify only (**Hu**) or dehumidify only (**dEHu**). **If you have selected dehumidify only, go directly to step #8.**	 *Default value: humidify only*
7		**Adjust humidify set point:** Display shows *"ADJUST HUMIDTY SETPNT"* and the humidity set point. You can change the humidity set point to the desired value; it should be within the humidity range. Lock symbol will appear if the set point was locked at step #5. Set point value is restricted by the minimum and maximum value. (step #3 & 4) **If you have selected humidify only at step #6, go directly to step #9.**	Set point range: 10 to 90 %RH Increment: 1 %RH *Default value: 40 %RH*

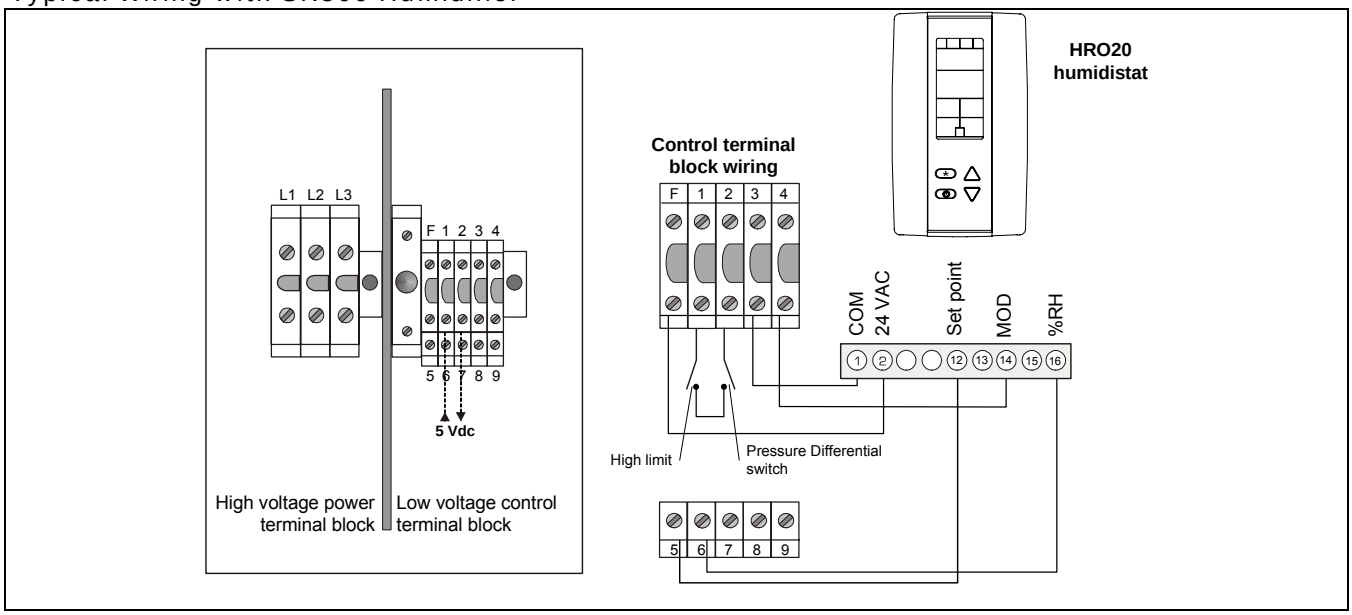
Step	Display	Description	Values
8		**Adjust dehumidify set point:** Display shows *"ADJUST DEHUMI SETPNT"* and the dehumidify set point. You can change the dehumidify set point to the desired value; it should be within the humidity range. Lock symbol will appear if the set point was locked at step #5. Set point value is restricted by the minimum and maximum value. (step #3 & 4)	Set point range: 10 to 90 %RH Increment: 1 %RH *Default value: 50 %RH*
9		**Set On/Off function enable or disable:** Display shows *"ENABLE ON OFF CONTROL MODE"*. You can enable or disable the On/Off function in control mode adjustment by end user. **If you have selected dehumidify only at step #6, go directly to step #11.**	 *Default value: Enable (YES)*
10		**Humidify proportional band:** Display shows *"HUMIDTY CONTROL RAMP"* and the value of humidify ramp. Humidify symbol is also displayed. Select the desired span for the humidify ramp. **If you have selected humidify only at step #6, go directly to step #12.**	Proportional band: 2 to 10 %RH Increment: 0.5 %RH *Default value: 5.0 %RH*
11		**Dehumidify proportional band:** Display shows *"DEHUMI CONTROL RAMP"* and the value of dehumidify ramp. Dehumidify symbol is also displayed. Select the desired span for the dehumidify ramp.	Proportional band: 2 to 10 %RH Increment: 0.5 %RH *Default value: 5.0 %RH*
12		**Control dead band:** Display shows *"CONTROL DEAD BAND"* and its value. Humidify/dehumidify symbol are also displayed since this value applies to both. Please select the desired dead band value. **If you have selected dehumidify only at step #6, go directly to step #14.**	Dead band range : 0.3 to 5.0 %RH Increment: 0.1 %RH *Default value: 0.3 %RH*
13		**Minimum voltage of AO1 output:** Display shows *"MIN VDC ANALOG AO1 OUTPUT"* and the value of the minimum voltage of the signal "**0.0**" for 0 to 10 Vdc or "**2.0**" for 2 to 10 Vdc. Humidify symbol is also displayed. Please select the desired value of the minimum voltage of AO1 output. **If you have selected humidify only at step #6, go directly to step #15.**	Range: 0.0 or 2.0 Volt *Default value: 0.0 Volt*
14		**Minimum voltage of AO2 output:** Display shows *"MIN VDC ANALOG AO2 OUTPUT"* and the value of the minimum voltage of the signal "**0.0**" for 0 to 10 Vdc or "**2.0**" for 2 to 10 Vdc. Dehumidify symbol is also displayed. Please select the desired value of the minimum voltage of AO2 output.	Range: 0.0 or 2.0 Volt *Default value: 0.0 Volt*
15		**Minimum voltage of AO3 output:** Display shows *"MIN VDC ANALOG AO3 OUTPUT"* and the value of the minimum voltage of the signal "**0.0**" for 0 to 10 Vdc or "**2.0**" for 2 to 10 Vdc. Humidify symbol is also displayed. Please select the desired value of the minimum voltage of AO3 output. **If you have selected dehumidify only at step #6, go directly to step #17.**	Range: 0.0 or 2.0 Volt *Default value: 0.0 Volt*

Step	Display	Description	Values
16		**Minimum voltage of AO4 output:** Display shows *"MIN VOC ANALOG AO4 OUTPUT"* and the value of the minimum voltage of the signal "**0.0**" for 0 to 10 Vdc or "**2.0**" for 2 to 10 Vdc. Humidify symbol is also displayed. Please select the desired value of the minimum voltage of AO4 output.	 Range: 0.0 or 2.0 Volt *Default value: 0.0 Volt*
17		**Set AI1 input signal:** Display shows *"SELECT AI1 INPUT SIGNAL"*. Select which signal you want for AI1 input. You can choose: • **OFF** (input not used), • **EHS.0** (external humidity sensor 0-10 Vdc), • **EHS.2** (external humidity sensor 2-10 Vdc), • **SPS** (external set point from Neptronic humidifier), • **HIL.0** (high limit 0-10 Vdc), • **HIL.2** (high limit 2-10 Vdc). **If you have selected OFF or SPS, go directly to step #20.** *Note: If SPS is selected, the dehumidify set point will be disabled.*	 *Default value: OFF*
18		**External humidity sensor offset calibration:** (If "**EHS.0**", " **EHS.2**", "**HIL.0**" or "**HIL.2**" has been selected at step #17) Display shows *"EXTERN HUMIDTY SENSOR OFFSET"* and relative humidity percentage read by external humidity sensor. Humidify symbol is also displayed. If the sensor is not connected or short circuited, the display shows *"Eror"*. You can adjust the calibration of the sensor by comparison with a known humidistat. For example if humidistat has been installed in an area where humidity is slightly different than the room typical humidity.	Range: 10 to 90 %RH (max. offset ± 5 %) Increment: 0.1 %RH 0.0 %RH = no humidity sensor
19		**Adjust high limit set point:** (If "**HIL.0**" or "**HIL.2**" has been selected at step #17) Display shows *"ADJUST SETPNT HIGH LIMIT"* and the high limit set point. Select the desired high limit humidity set point; this one should be within the high limit range.	Set point range: 10 to 90 %RH Increment: 1 %RH *Default value: 80 %RH*
20		**Set AI2 input signal:** Display shows *"SELECT AI2 INPUT SIGNAL"*. Select which signal you want for AI2 input. You can choose: • **OFF** (input not used), • **Wts** (Window Temperature Sensor 10KΩ), • **OtS** (Outside Temperature Sensor 10KΩ). **If you have selected OFF, go directly to step #1.**	 *Default value: OFF*
21		**External temperature sensor calibration:** (If "**WtS**" or "**EtS**" has been selected at step #20) Display shows *"EXTERN TEMPER SENSOR OFFSET"* and the temperature read by the external temperature sensor (if connected on the selected input). If the sensor is not connected or short circuited, the display shows *"Eror"*. You can adjust the calibration of the external sensor by comparison with a known thermometer.	Range: -30 to 90 ºC [-22 to 194 ºF] (max. offset ± 5 ºC) Increment: 0.1 ºC [0.2 ºF]
22		**Window temperature sensor compensation factor:** (If "**WtS**" has been selected at step #20) Display shows *"WINDOW TEMPER SENSOR COMPENS"* and the value of the compensation factor. You can adjust the compensation factor to avoid condensation on the window. The lower the compensation factor, the lower the maximum humidity set point can be.	Range : 25 to 90 Increment: 5 *Default value:* 80

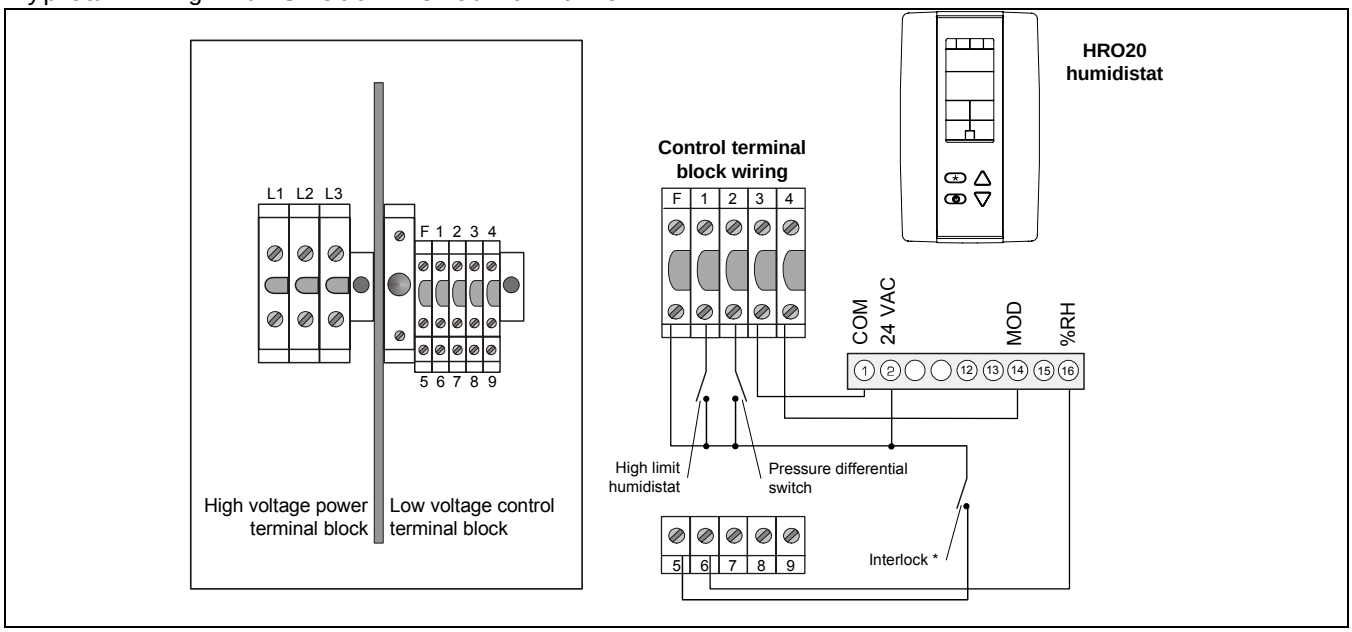
Operation Mode

Step	Description	Display
A	At powering up, humidistat will light display and activate all LCD segments during 2 seconds. **Illuminating the LCD** To illuminate the LCD, you just have to push onto any of the 4 buttons. LCD will light for 4 seconds. **Humidity display** In operation mode, humidistat will automatically display the humidity reading. If "**OFF**", "**- - -**" and alarm symbol are displayed, the humidity sensor is not connected or short circuited. **Temperature display** To display the temperature, press on ⊛. The temperature reading is displayed for 2 seconds, if "**- - -**" is displayed, the temperature sensor is not connected or short circuited. To change the scale between ºC and ºF, press on both Δ and ∇ for 3 seconds. **Alarm** If there is an issue with the humidifier, the alarm⚠ symbol will be displayed. *Note: Available only if the humidifier alarm output (NO) is connected to the humidistat.*	
B	**<u>Humidity set point(s) display and adjustment</u>** 1. To display the set point(s), press two times on Δ or ∇. 2. **If Contol Mode was set to Humidify only or Dehumidify only:** 2.1. Humidify or Dehumidify set point will be displayed during 3 seconds. 2.2. To adjust set point, press on Δ or ∇ while the set point is displayed. **If Contol Mode was set to Automatic Humidify and Dehumidify:** 2.1. Humidify set point will be displayed during 3 seconds. To adjust the set point, press on Δ or ∇ while the set point is displayed. 2.2. Press on ⊛ to switch to the dehumidify set point. To adjust the set point, press on Δ or ∇ while the set point is displayed. 2.3. You can press on ⊛ to go back to display the humidify set point or go step 3. 3. After 3 seconds of no buttons activity, the humidistat will return to normal mode. *Note: If set point adjustment has been locked, 🔒 symbol will be displayed.*	
C	**<u>On/Off selection :</u>** To turn On/Off the humidistat, press once onto the ⏻ button. Control mode will be displayed during 5 seconds. ✓ Humidify only / OFF ✓ Dehumidify only / OFF ✓ Automatic Humidify & Dehumidify / OFF *Note: These selections can vary according to the choice made in step #6 of the programming mode.*	

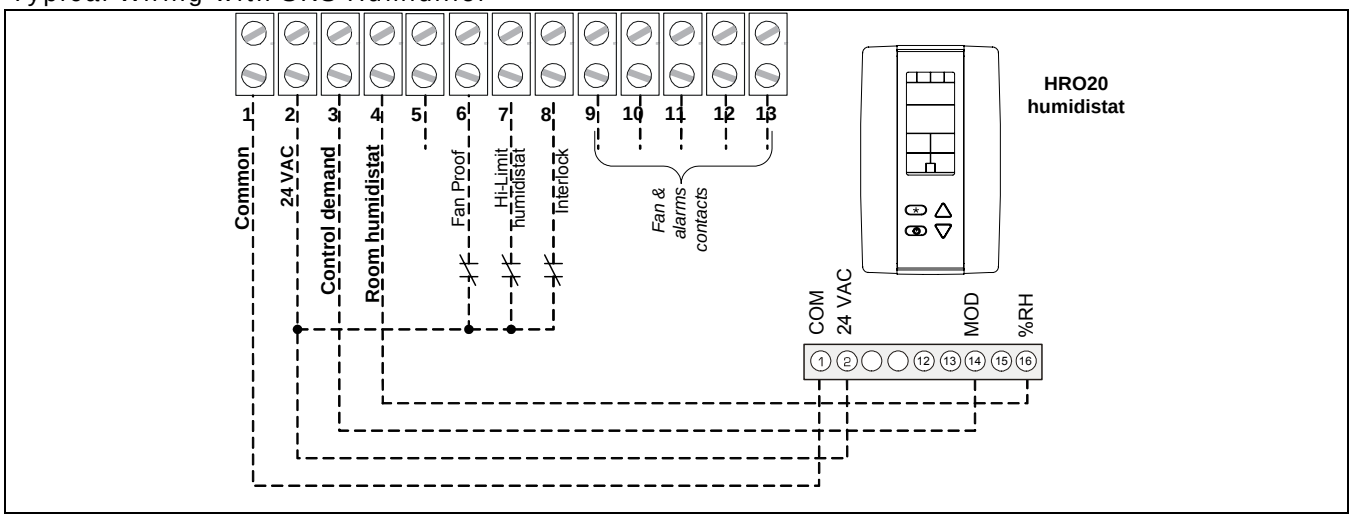
Typical Wiring with SK300 Humidifier



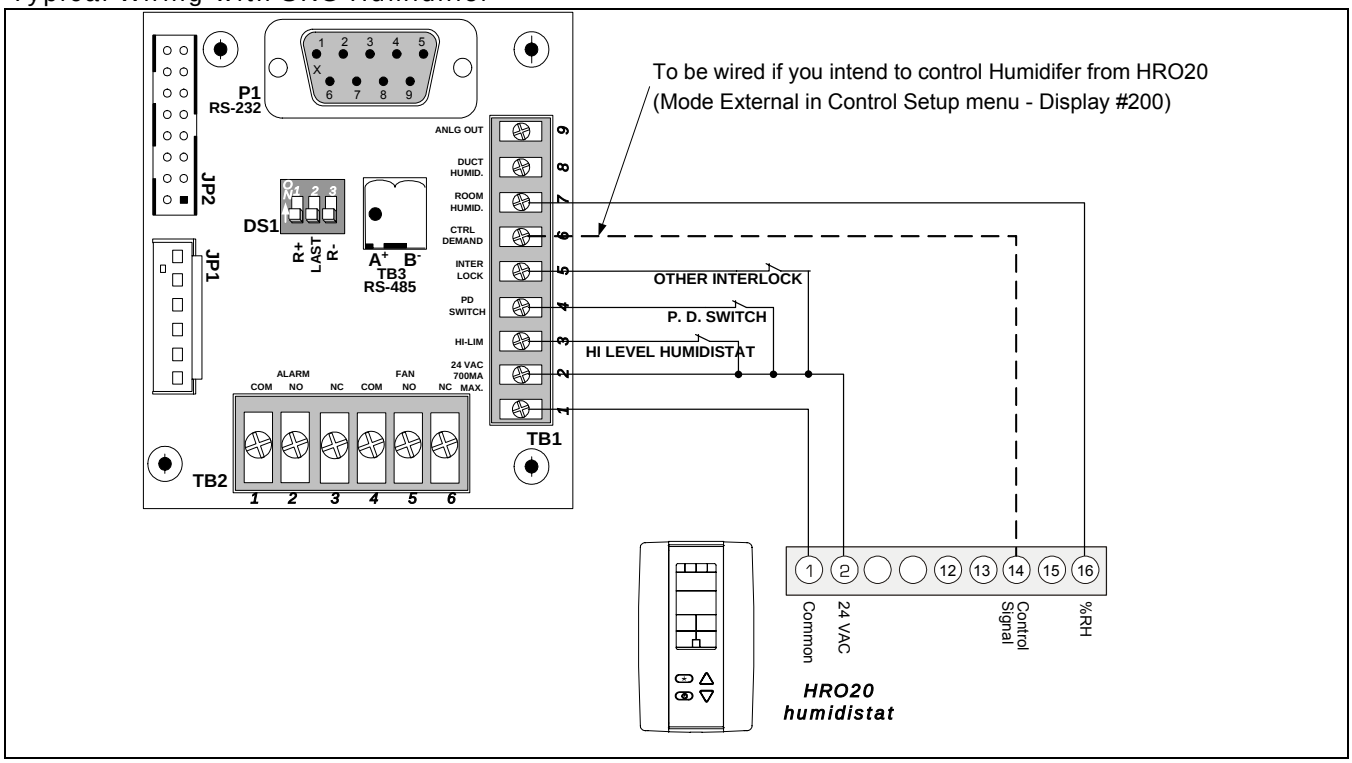
Typical Wiring with SK300 BACnet Humidifier



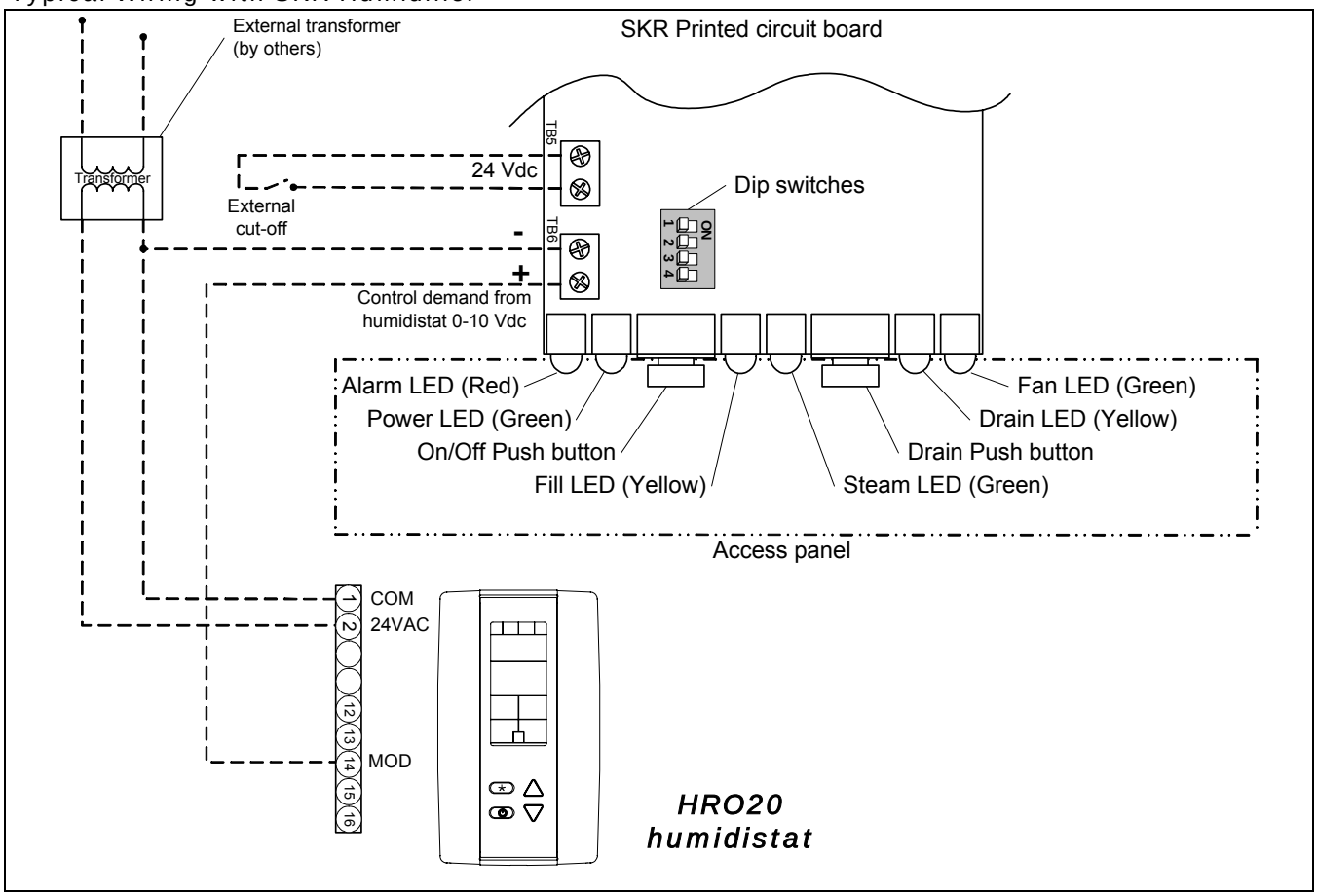
Typical Wiring with SKS Humidifier



Typical Wiring with SKG Humidifier



Typical Wiring with SKR Humidifier



Recycling at end of life

	At end of life, please return the thermostat to your Neptronic® local distributor for recycling. If you need to find the nearest Neptronic® authorized distributor, please consult **www.neptronic.com**.